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# Transitioning to a 21st century U.S. Navy

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For the Strategic Discussion Group

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# Background

- The New Navy Fighting Machine Study designed a fleet in 2009 to support an affordable bimodal navy described qualitatively in 2007
- The study also demonstrated CS-21 Strategy to be affordable and viable
- NNFM ground rule: Only existing ships, aircraft, or systems allowed
- To press to reduce costs, some ships were undercosted, e.g., $10B for CVN
- Neither constraint applies in this briefing. Navy costs used throughout
- The bimodal navy serves as a foundation for a comprehensive expanded scalable future fleet under favorable Navy budget circumstances
- But the budget is more likely to be cut than to expand
- SCN is proxy for total fleet costs. For example:
  - Annual APN is actually bigger than SCN
  - Life Cycle Costs are equally important

# Purpose and Justification

- Purpose is to illustrate a sequence of transitions to a bimodal fleet
- "Usually more than one piece of technology is required to create a revolution."
  - Hughes, *Fleet Tactics and Coastal Combat,* p. 239
- "The proponents of competing paradigms are always at least slightly at cross-purposes. . . The competition between paradigms is not the sort of battle that can be resolved by proofs. . . .the transition . . .must occur all at once (though not necessarily in an instant) . . ."
  - T. S. Kuhn, *The Structure of Scientific Revolutions, 3rd Ed,* pp. 148-150

# BLUF: A Transition Sequence

- **Start Now**: Build a flotilla of 50-plus missile corvettes
- **Start Now**: Build other littoral ships for ASW, MCM, NGFS
- **Start Now:** Non-nuclear SSKs to complement SSNs
- **Underway Now**: Underwater systems focused on the China Seas
- **Virtually Underway**: Holiday on amphibious assault ships; replace some with fast or efficient amphibious lift by 2022
- **Design Now**: Next generation blue water surface combatants to enter fleet in 2031
- **Start Soon**: Some small, fast CLF ships to sustain littoral fleet
- **Awaiting Aircraft Decisions**: Smaller carriers to replace inevitably fewer CVNs
- **No Solution**: Cost of Strategic Deterrence (SSBN and TBMD)

# Historical Transitions—a Sense of Pace

- Battleship Era: 60 years (1880 to 1940)
- Aircraft Carrier Era: 40 years (1940 to 1980)
- Missile Ship  Era: 30 years (1980 to 2010)
- Era of Unmanned and Robotic Systems: (2010 to .... ?)
- A U. S. Navy transition is overdue

# 1. A Flotilla of Missile Combatants

- Missile age created a Billy the Kid effect: deadly things in small, sneaky packages
- Missile corvettes will ambush in cluttered littoral waters
- Corvettes do missile warfare only. ASW, MCM are different ships
- LCS SCN $$ after #24 can be a $14B planning wedge
- Action: Build 8 corvettes of proven designs that cost $100M each
- Swedish *Visby* class w/o its ASW and MCM exemplifies
- First generation helps develop tactics, train, and improve designs
- Next generation may be smaller, cheaper, and be manned, optionally manned, and unmanned
- Aim at flotilla of 64 combatants: $14B buys that many with money left over for ASW, MCM, NGFS, and logistics ships

# 2. Three Other Littoral Warship Roles

- 12 MCM ships. Put LCS's MCM modules in 15 knot ships
- 12 ASW ships for shallow water escort or submarine hunting
- 12 NGFS ships to operate inshore. Weapon TBD (Rail gun?)
- None have high speed. Cost $150-$200M each, total $6B
- Affordable but not intended to be expendable
- Operate in task-oriented squadrons, protected when necessary
- Numbers (12 each) are a SWAG taken from the NNFM study
- For aviation roles, see #7 below

# 3. Undersea Systems

- Submarines are back: central for the China and Arabian Seas
- Forty is not enough.
- But at $2.7B each, more than 40 SSNs is not affordable
- New undersea unmanned systems are already in development
- Addition of many small coastal non-nuclear SSKs is desirable
- Mix of 80 subs is affordable if SS cost < $0.8B (1/3 of SSN)
- SSNs have strategic mobility; SSKs in theater have ASUW focus
- Train both to attack warships and commerce in littoral waters

# 4. Amphibious Delivery Ships

- Take 10-year holiday on big amphibious assault ships
  - Defers three ships and provides a $6.4B wedge through 2022
  - Gives USMC a decade to decide on future roles and desired ships
- Funds:
  - (1) 8 or more small, swift amphibious lift vessels and
  - (1) many big RO/RO and container ships to deliver ground forces efficiently to friendly ports
- Together (1) & (2) support overseas contingencies of any size
- But they do not support large opposed assaults

# 5A. Blue Water Surface Combatants

- Basic issue: Offense has developed faster than defense with:
  - Supersonic, low observable, sea skimming missiles
  - Ballistic missiles with terminal homing
  - Autonomous Harpies in large numbers to blind hard-kill defense radars
  - Cooperating swarms of robotic systems are coming soon
- Start now to design an affordable replacement for DDG(X):
  - Eight long range surface-to-surface missiles and 76 mm gun
  - Self-defense suite of short range, fast acting, soft and hard kill
  - ASW suite adapted from LCS module
  - Modern IT suite including scalable AMDR
  - Helicopters/UAVs for decoy/deception and short range detection/ targeting

# 5B. Surface Combatants (Continued)

- Frigate characteristics are approximations. It will take war games, campaign analyses, and design work to refine them
- Introduce frigates NLT 2031 when DDG(X) is programmed
- Use DDG(X) funds ($70B) as a production wedge
- Build 80 frigates at 6 a year, vice 30 DDG(X) at 2-3 a year
- About 3,000 tons, maximum crew 100
- Maintain about 30 area defense SAM ships (improved Aegis) for low threat regions
- Allow DDG/FF mix to evolve as threat evolves
- Serve both as escorts and Surface Strike Groups

# 6. CLF SHIPS

- Some small CLF ships are needed for littoral waters
- Assert 25 vice 31 large ships (T-AKE size) sufficient for future blue water operations
- Big, unescorted CLF ships likely Achilles heel of vulnerability
- Replace some with small ones, numbers TBD
  - Preliminary NPS studies show fuel is the driving commodity
  - Small CLF ships can be risked more readily

# 7. Sea Based Air Platforms

- Aircraft cost dominates ship cost; hence only 65 a/c per CVW
- Procurement of one CVN/CVW system costs about $20B
- 11 CVNs looks unsustainable; but sea based air need persists
- NNFM keeps 6 CVNs, replaces 5 with many smaller carriers for less demanding scenarios—using $50B and 30K billets from the 5 CVNs
- No APN savings. Different aircraft distributed in smaller carriers
- Transition goal is a graceful reduction in big decks.
- CVLs can be nuclear powered if desirable. Biggest cost is a/c LCC
- Design new carriers for mission-oriented aircraft
- Can't shape a ship transition until the aircraft side gets clearer:
  - Roles and mix of UAVs and UCAVs cooperating with manned a/c
  - Possibility of 3,000 ton CVE-X to carry 40-50 multi-capable BQMs
  - Suitability of F-35B STOVL depends on cost, not performance

# 7. Strategic Deterrence Force

- Listed last because requirement is hopeless budget conundrum
- NNFM study put 10% SCN ceiling on strategic deterrent
- That bought only 9 SSBN at $4.5B & 9 TBMD ships at $2.2B
- Currently USN plans for 12 SSBN at $6.5B and unknown number of TBMD ships at around $4B.
- Would double NNFM cost
- Also should include cost of nuclear missiles carried
- A critical problem that must be solved.

# Still Not Out of the Woods . . .

- This 7-step transition restores flexible responses for China and provides for an affordable presence anywhere
- It puts the US Navy in the missile age and prepares for the robotics age
- . . .takes SCN of $13.5B/year without strategic deterrent buys
- The Navy plan needs $15B without strategic deterrent buys
- Should the future SCN budget shrink to (say) $10B/year, even more drastic surgery is certain

# Summary Appraisal

- Building missile corvettes now opens all doors
- Green water ships with their large numbers and deployments forward complement the inevitably smaller blue water fleet
- Blue water fleet stays powerful and "over the horizon"
- Emphasis is on preserving maritime superiority over China
- But a bimodal fleet provides selective presence where needed, and blue water ships on demand
- Bimodal fleet supports maritime collaboration with friends, and helps create a "1,000 ship navy" worldwide

# Wrap Up– The Real Transition

- The transition puts U. S. Navy in the missile age
- It puts some of our combat eggs in many smaller baskets
- Distributability is key:
  - Tactical for missile age combat
  - Operational for affordable presence anywhere, but not everywhere
- Simpler designs. Smaller unit cost. Shorter lifetimes. Single functions. Rapid adaptation to change.
- Exploits cyber and unmanned technology
- Anticipates the impending Era of Robots
- Success entails creating a cadre of professional sailors who know the technology and develop littoral doctrine & tactics

# Post Script: Imagine a Third (?) Generation Squadron

- Suggested by participants, NPS Warfare Innovation Workshop
- The squadron comprises one manned and five almost identical optionally unmanned 200-ton vessels for littoral combat
  - Offense: New generation hypersonic, low detectability, multi-warhead, medium range surface-to-surface missiles, some with anti-radiation, some carrying decoys
  - Defense: automated decoys, electronic smoke for soft kill, laser gun
  - Self-scouting with unmanned vehicles
  - Modular for rapid plug-in upgrades